1.0 EXECUTIVE SUMMARY

Sixteen (16) groundwater samples (including one field duplicate and one rinsate blank) were collected in July 1993, for the Occidental Chemical Corporation (OxyChem) Off-Site Investigation (OSI) in Niagara Falls, New York. The samples were analyzed for benzene, general organics[1], HPLC parameters, total soluble phosphorous, total organic carbon (TOC), total organic halides (TOX), and various metals.

Benzene

Most benzene results were acceptable without qualification. Qualification of the remaining data as estimated was due to holding time exceedances of one day and three slightly high surrogate recoveries. Most of the samples contained less than 40 µg/L of benzene. Samples OW653B, OW658C, OW658D and OW659B contained levels of benzene ranging from 150 to 1500 µg/L.

General Organic Parameters

Most sample analysis results were acceptable without qualification. The only exception was the trichloroethene result reported for sample OW652C which was qualified as estimated due to low MS/MSD recoveries.

Samples were reported to contain chlorotoluenes, chlorobenzene, dichlorobenzenes, chlorobenzotrifluorides, trichloroethylene, hexachlorocyclohexane, and tetrachloroethylene. The highest concentrations of general organic compounds were observed in samples OW658C, OW658D, OW659B and OW659C.

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1 General Organic and HLPC parameters are listed in Table 2.

HPLC Parameters

All quality control data were acceptable, indicating good accuracy and precision were achieved during sample analysis. All sample results were ND.

Total Soluble Phosphorus

All quality control data were acceptable, indicating good accuracy and precision were achieved during sample analysis. A phosphorus concentration of 17 µg/L was reported for sample MW-1 while all other phosphorus results were ND.

TOC

Positive TOC results ranging from 2 to 12 mg/L were reported by the laboratory. Due to low level TOC concentrations reported for both the method blanks and rinse blank all sample concentrations less than or equal to 5 mg/L were qualified as non-detect. All remaining data were acceptable without qualification except for the result for sample OW658B which was flagged as estimated due to a slightly low matrix spike recovery.

TOX

Upon review of the TOX data, several deficiencies in the execution of the method were observed. The most critical of these deficiencies was that column breakthrough exceeded the 10 percent limit established in Method 450.1. Due to the uncertainty of the resulting data, all TOX results were rejected (R).

The deficiencies have been addressed by the laboratory and corrective measures are being implemented to ensure the quality of future TOX analysis.

Metals Analysis

All quality control data provided for arsenic, lead and mercury analyses were acceptable indicating good accuracy and precision were achieved.

All arsenic and mercury results were ND. Lead concentrations from 19 to 37 µg/L were reported for samples OW653B, OW653C, OW658D, OW659D and MW-1.

2.0 GENERAL

Analytical services for Occidental Chemical Corporation (OxyChem) were provided by Recra Environmental Incorporated (Recra), Wadsworth/Alert Laboratories (WAL), OxyChem Technology Center - Central Sciences and the OxyChem Niagara Plant Works Laboratory.

Sixteen (16) groundwater samples (including one field duplicate and one rinsate blank) were collected in July 1993 for the OSI. A sample key is presented in Table 1. The samples were submitted to the above laboratories for the following analyses:

Parameter	*Analytical Method*
Benzene	USEPA SW-846 Method 8020
General Organics[1]	Occidental Chemical Corporation Microextraction Method
HPLC Parameters[1]	Modified Solvent Exchange Method
Total Soluble Phosphorous	40 CFR Part 136 Method 365.2
Total Organic Carbon (TOC)	USEPA SW-846 Method 9060
Total Organic Halides (TOX)	USEPA Method 450.1 (Modified)
Arsenic and Lead	USEPA Method 200.7
Mercury	USEPA SW-846 Method 7470

The above methods are referenced from sources as detailed in Appendix C - Chemical Sampling and Quality Assurance Plan, Niagara Plant Supplemental Data Collection Program, May 9, 1988, hereinafter referred to as the "QAP".

A summary of the analytical results is presented in Table 3. The Quality Assurance/Quality Control (QA/QC) criteria by which these data have been assessed are outlined in the QAP.

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1 General Organics and HPLC Parameters are listed in Table 2.

3.0 HOLDING TIMES

Sample holding times as specified in the relevant methods and the "QAP" are summarized in Table 4. Adherence to these holding time criteria was evaluated by comparison of collection and extraction (and/or analysis) dates obtained from the Chain of Custody forms and final analytical reports respectively. A summary of all sample holding times is attached as Table 5.

Benzene analysis was performed on samples OW652B, OW658B, OW658C, OW658D AND OW661B outside of the seven day holding time sited in both the "QAP" and Method 8020. In general, holding time exceedences tend to demonstrate a low bias in results due to the potential loss of the analyte of concern. The associated benzene results for these samples were therefore qualified as estimated.

4.0 SAMPLE PRESERVATION

Upon review of the field log notebooks and sample Chain of Custody forms, it was determined that all samples were properly preserved after collection. All samples were received by the laboratory at 4°C (±2°C), indicating proper storage of samples during shipment.

5.0 METHOD BLANK ANALYSES

The purpose of assessing the results of laboratory blank analyses is to determine the existence and magnitude of contamination introduced during analysis. Laboratory blanks were analyzed at a minimum frequency of one per 20 investigative samples and/or one per analytical sequence. A summary of the method blank analyses data is presented in Table 6.

TOC values of 1 mg/L were reported for the method blanks analyzed. All sample concentrations less than five times the associated blank concentration were qualified as non-detect, as these results are probably a reflection of laboratory contamination (see Table 7).

A perchloropentacyclodecane result was not available for the method blank extracted on July 14, 1993 for general organics due to a broad interference peak. As all sample results reported for this compound were ND, this interference peak appeared to be an isolated incident and did not warrant qualification of sample data. Blank analyses for all other parameters yielded non-detect results, indicating that laboratory contamination was not a factor for these analyses.

6.0 SURROGATE SPIKE RECOVERIES

In accordance with Method 8020, all samples and blanks analyzed for benzene are spiked with surrogate prior to analysis. Surrogate recoveries provide a means to evaluate the effects of individual sample matrices on analytical efficiency. Control limits for acceptable surrogate recoveries are specified in the "QAP" as 50 to 120 percent.

The surrogate compound employed for VOC analysis was alpha, alpha, alpha-trifluorotoluene, and a summary of the surrogate recoveries is presented in Table 8. Surrogate recoveries could not be reported for samples OW652C, OW657B, OW657C, OW657D and OW658B due to sample matrix interferences. For all of these samples except OW658B, an alternative surrogate, 1-chloro-4-fluorobenzene, was employed to evaluate analytical efficiency. Surrogate performance could not be assessed for sample OW658B.

Outlying (high) surrogate recoveries were reported for samples OW652B, OW652C and OW661B (duplicate of OW652B). As this may indicate a high bias in the VOC data, all positive benzene results for these samples were qualified as estimated (see Table 9).

The analysis of all remaining VOC samples yielded surrogate spike recoveries within the contract control limits. Laboratory performance was deemed acceptable on an individual sample basis, with the exceptions noted above.

7.0 BLANK SPIKE ANALYSES

Blank spikes are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects. Blank spike analyses are performed at a minimum frequency of one per 20 investigative samples, or one per analytical batch. Control limits for acceptable spike recoveries are specified in the "QAP" as 60 to 100 percent, however, recoveries up to 120 percent were considered acceptable.

Blank spikes were reported for the analyses of general organic and HPLC parameters, and a summary of the results is presented in Table 10. The analysis of one blank spike (extracted on July 9, 1993 for general organic parameters) yielded a 121 percent recovery for perchloropentacyclodecane which is slightly above the control limits. This may indicate a high bias in positive results for this compound. As all sample results for perchloropentacyclodecane were ND, however, no qualification of the data was necessary.

Due to the broad interference peak previously reported for the method blank extracted on July 14, 1993 for general organic parameters, a spike blank recovery for perchloropentacyclodecane was also unavailable for evaluation.

All other blank spike analyses for both general organic and HPLC parameters were within the control limits, indicating acceptable analytical efficiency was achieved.

8.0 REFERENCE STANDARD ANALYSES

In order to evaluate the accuracy of instrument calibration, reference standards are obtained from an independent source and analyzed. Reference standard analysis is performed at a minimum frequency of one per 20 investigative samples, or one per analytical batch. Reference standards were analyzed for general organics, arsenic and lead, and TOC analyses and the results are summarized in Table 11.

Control limits specified in the "QAP" for the analysis of general organics reference standards were 60 to 100 percent. Again, recoveries up to 120 percent were deemed acceptable. All reference standards recoveries were within these limits indicating good analytical accuracy was achieved for this analysis.

All reference standard analyses for TOC, arsenic and lead yielded recoveries within generally acceptable limits of 80 to 120 percent. Thus, acceptable analytical accuracy was also achieved for these analyses.

9.0 MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) ANALYSES

The recoveries of MS/MSD analyses are used to assess the analytical accuracy achieved on individual sample matrices. The relative percent difference (RPD) values between the MS and MSD results are used to assess analytical precision. MS/MSD analyses were performed at a minimum frequency of one per 20 investigative samples for benzene, general organic and HPLC parameters. MS/MSD recoveries and RPDs are summarized in Table 12. As established in the "QAP", control limits for percent recovery were 60 to 100 percent (although, for data validation purposes, an upper control limit of 120 percent was employed) and a maximum RPD value of 20 percent was considered acceptable.

All MS/MSD recoveries and RPD values reported for the HPLC and benzene analyses were acceptable based on the criteria stated above. On this basis, analytical accuracy and precision were deemed acceptable for these analyses.

For general organic parameters analysis, MS/MSD recoveries for sample OW657C could not be reported for trichloroethylene and tetrachloroethylene due to high concentrations in the sample. Thus, accuracy and precision for the analysis of these compounds could not be evaluated on the basis of MS/MSD results.

Analysis of the MS for sample OW657C also yielded an outlying (high) recovery for perchloropentacyclodecane. Since the MS recovery reported for this compound was acceptable, however, qualification of the data was not necessary.

For sample OW652C, the MS and MSD recoveries reported for trichloroethylene were below the control limits. Since reference standard and blank spike recoveries for this compound were acceptable, the low recoveries appear to be matrix related. Because these recoveries may indicate a low bias, the trichloroethylene result reported for this sample was qualified as estimated.

All remaining MS/MSD recoveries and RPD values reported for general organic parameters analysis were acceptable, indicating good laboratory precision and accuracy were achieved.

10.0 MATRIX SPIKE (MS) ANALYSES

The recoveries of MS analyses are used to assess the analytical accuracy achieved on individual sample matrices. Matrix spikes were performed at a minimum frequency of one per 20 investigative samples for metals, phosphorous, and TOC analyses. Recoveries are summarized in Table 13.

All MS recoveries were evaluated against control limits of 75-125 percent. A recovery of 74 percent was reported for the TOC MS analysis. As the reference standard previously evaluated for TOC analysis was acceptable, the low recovery is probably caused by the sample matrix. As this result may indicate a low bias in TOC data reported for this sample, the TOC result for sample OW658B was qualified as estimated.

All MS recoveries reported for metals and phosphorus were acceptable, indicating acceptable analytical accuracy was achieved for these analyses.

11.0 DUPLICATE SAMPLE ANALYSES

In order to assess laboratory precision, duplicate samples are prepared and analyzed by the laboratory. Analytical precision is deemed acceptable if resulting RPD values are less than 20 percent for sample values greater than five times the contract required detection limits (CRDLs). For sample results less than five times the CRDL, a control limit of plus or minus two times the CRDL is employed.

For this study, duplicate arsenic and lead analyses were performed on sample OW658C. A summary of the analytical data and resulting RPDs is presented in Table 14. Since all results for these analyses were non-detect, RPD values were not applicable and analytical precision was deemed acceptable.

12.0 FIELD QA/QC

12.1 RINSATE BLANK ANALYSES

Rinsate blanks are collected and analyzed to evaluate the possibility of cross-contamination introduced during sampling. For this study, a rinse blank was collected and analyzed for all parameters. A summary of the results is attached as Table 15.

TOC analysis of the rinse blank yielded a result of 1 mg/L. All sample results less than five times these concentrations were qualified as non-detect due to the likelihood that they reflect contamination. A summary of the qualified data is presented in Table 16. All other analyses yielded non-detect results indicating that contamination introduced during sampling was not a factor in this study.

12.2 FIELD DUPLICATE ANALYSES

In order to asses the analytical and sampling protocol precision, field duplicate samples are collected and submitted "blind" to the laboratory for analysis. Precision is then evaluated based on the RPD values reported.

For this study, the field duplicate samples collected were samples OW652B and OW661B. A summary of the field duplicate results and RPD values is presented in Table 17. In accordance with the "QAP", RPD values less than 20 percent were considered acceptable for general organics, benzene and HPLC analyses. For all other analyses, a general limit of 30 percent was employed to evaluate overall precision.

All RPD values reported for field duplicate analyses were less than the limits cited above. Analytical and sampling precision were deemed acceptable for these parameters on this basis.

13.0 CONCLUSIONS

Based on the assessment detailed in the foregoing, the data produced by WAL, Recra, OxyChem Technology Center - Central Sciences and The OxyChem Niagara Plant Works Laboratory are acceptable with the specific exceptions and qualifications noted herein.

TABLE 1

SAMPLE KEY
PHASE 2 - ROUND 2 OSI SAMPLING
OCCIDENTAL CHEMICAL CORPORATION
JULY 1993

Sample I.D.	*Well I.D.*
MW-1	MW-1
OW652B	OW652B
OW652C	OW652C
OW653B	OW653B
OW653C	OW653C
OW657B	OW657B
OW657C	OW657C
OW657D	OW657D
OW658B	OW658B
OW658C	OW658C
OW658D	OW658D
OW659B	OW659B
OW659C	OW659C
OW659D	OW659D
OW661B	OW652B (Duplicate)

TABLE 2

GENERAL ORGANIC AND HPLC PARAMETERS
PHASE 2 - ROUND 2 OSI SAMPLING
OCCIDENTAL CHEMICAL CORPORATION
JULY 1993

General Organics

Toluene
Chlorobenzene
2-Chlorotoluene
4-Chlorotoluene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
1,2-Dichlorobenzene
2,3-/3,4-Dichlorotoluene
2,6-Dichlorotoluene
2,3-/3,4-Dichlorotoluene
Trichloroethylene
Tetrachloroethylene
4-Chlorobenzotrifluoride
2-Chlorobenzotrifluoride
3,4-Dichlorobenzotriflouride
2,4-Dichlorobenzotriflouride
1,2,4-Trichlorobenzene
1,2,3-Trichlorobenzene
Hexachlorobutadiene
2,4,5-Trichlorotoluene
2,3,6-Trichlorotoluene
1,2,4,5-Tetrachlorobenzene
Hexachlorocyclopentadiene
2,4,5-Trichlorophenol
1,2,3,4-Tetrachlorobenzene
Octachlorocyclopentene
a-Hexachlorocyclohexane
b-Hexachlorocyclohexane
Hexachlorobenzene
g-Hexachlorocyclohexane
d-Hexachlorocyclohexane
Perchloropentacyclodene (Mirex)

HPLC Parameters

Benzoic Acid
2-Chlorobenzoic Acid
3-Chlorobenzoic Acid
4-Chlorobenzoic Acid
Chlorobenzoic Acids, Total
Chloroendic Acid

TABLE 3
ANALYTICAL DATA SUMMARY
PHASE 2 - ROUND 2 OSI SAMPLING 1993
OCCIDENTAL CHEMICAL CORPORATION
JULY 1993

Sample Description:			*OW652B*	*OW661B*	*OW652C*	*OW653B*	*OW653C*
Sample Date:			*07/08/93*	*Dup.*	*07/09/93*	*07/13/93*	*07/13/93*
Analytes	*Units*	*Detection Level*					
Phosphorus, Total Soluble	µg P/L	10	ND	ND	ND	ND	ND
Arsenic	µg/L	19	ND26	ND 26	ND 26	ND 23	ND 23
Mercury	µg/L	0.4	ND	ND	ND	ND	ND
Lead	µg/L	18	ND 33	ND 33	ND 33	19	21
Toluene	µg/L	1	ND	ND	ND	ND	ND
2-Chlorotoluene	µg/L	1	ND	ND	12	55	ND
4-Chlorotoluene	µg/L	1	ND	ND	ND	ND	ND
2,4-/2,5-Dichlorotoluene	µg/L	1	ND	ND	ND	ND	ND
2,6-Dichlorotoluene	µg/L	1	ND	ND	ND	ND	ND
2,3-/3,4-Dichlorotoluene	µg/L	1	ND	ND	ND	ND	ND
2,3,6-Trichlorotoluene	µg/L	1	ND	ND	ND	ND	ND
2,4,5-Trichlorotoluene	µg/L	1	ND	ND	ND	ND	ND
Benzene	µg/L	1	5J	5J	18	150J	ND
Chlorobenzene	µg/L	1	ND	ND	2	140	ND
1,2-Dichlorobenzene	µg/L	1	ND	ND	ND	4	ND
1,3-Dichlorobenzene	µg/L	1	ND	ND	4	12	ND
1,4-Dichlorobenzene	µg/L	1	ND	ND	2	12	ND
1,2,3-Trichlorobenzene	µg/L	1	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	µg/L	1	ND	ND	1	ND	ND
1,2,3,4-Tetrachlorobenzene	µg/L	1	ND	ND	ND	ND	ND
1,2,4,5-Tetrachlorobenzene	µg/L	1	ND	ND	ND	ND	ND
Hexachlorobenzene	µg/L	1	ND	ND	ND	ND	ND
Trichloroethylene	µg/L	1	2	2	26J	ND	ND
Tetrachloroethylene	µg/L	1	ND	ND	4	ND	ND
2-Chlorobenzotrifluoride	µg/L	1	ND	ND	ND	ND	ND
4-Chlorobenzotrifluoride	µg/L	1	ND	ND	11	26	ND
2,4-Dichlorobenzotrifluoride	µg/L	1	ND	ND	ND	ND	ND
3,4-Dichlorobenzotrifluoride	µg/L	1	ND	ND	ND	ND	ND
Hexachlorobutadiene	µg/L	1	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene	µg/L	1	ND	ND	ND	ND	ND
Octachlorocyclopentene	µg/L	1	ND	ND	ND	ND	ND
Perchloropentacyclodecane (Mirex)	µg/L	1	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol	µg/L	10	ND	ND	ND	ND	ND
a-Hexachlorocyclohexane	µg/L	1	ND	ND	1	ND	ND
b-Hexachlorocyclohexane	µg/L	1	ND	ND	ND	ND	ND
g-Hexachlorocyclohexane	µg/L	1	ND	ND	ND	ND	ND
d-Hexachlorocyclohexane	µg/L	1	ND	ND	ND	ND	ND
Benzoic acid	µg/L	100	ND	ND	ND	ND	ND
2-Chlorobenzoic acid	µg/L	30	ND	ND	ND	ND	ND
3-Chlorobenzoic acid	µg/L	30	ND	ND	ND	ND	ND
4-Chlorobenzoic acid	µg/L	30	ND	ND	ND	ND	ND
Chlorobenzoic acids, total	µg/L	90	ND	ND	ND	ND	ND
Chlorendic acid	µg/L	250	ND	ND	ND	ND	ND
Total Organic Carbon (TOC)	mg/L	1	7	9	ND3	ND4	ND3
Total Organic Halides (TOX)	µg/L	50	R	R	R	R	R

Notes:

ND - Not detected at or above the detection level shown in the column entitled "Detection Level". Where detection levels vary, the detection level is shown with the respective analyses.

J - Associated result is estimated

R - Result was rejected

TABLE 3
ANALYTICAL DATA SUMMARY
PHASE 2 - ROUND 2 OSI SAMPLING 1993
OCCIDENTAL CHEMICAL CORPORATION
JULY 1993

Sample Description:			*OW657B*	*OW657C*	*OW657D*	*OW658B*	*OW658C*
Sample Date:			*07/07/93*	*07/07/93*	*07/07/93*	*07/12/93*	*07/12/93*
Analytes	*Units*	*Detection Level*					
Phosphorus, Total Soluble	µg P/L	10	ND	ND	ND	ND	ND
Arsenic	µg/L	19	ND 26	ND 26	ND 26	ND 23	ND 23
Mercury	µg/L	0.4	ND	ND	ND	ND	ND
Lead	µg/L	18	ND 33	ND 33	ND 33	ND 18	ND 18
Toluene	µg/L	1	ND	ND	ND	ND	ND
2-Chlorotoluene	µg/L	1	ND	ND	4	ND	130
4-Chlorotoluene	µg/L	1	ND	ND	ND	ND	14
2,4-/2,5-Dichlorotoluene	µg/L	1	ND	ND	ND	ND	6
2,6-Dichlorotoluene	µg/L	1	ND	ND	ND	ND	ND
2,3-/3,4-Dichlorotoluene	µg/L	1	ND	ND	ND	ND	2
2,3,6-Trichlorotoluene	µg/L	1	ND	ND	ND	ND	ND
2,4,5-Trichlorotoluene	µg/L	1	ND	ND	ND	ND	ND
Benzene	µg/L	1	ND	ND	ND	6J	1100J
Chlorobenzene	µg/L	1	ND	ND	1	4	380
1,2-Dichlorobenzene	µg/L	1	ND	ND	ND	ND	64
1,3-Dichlorobenzene	µg/L	1	ND	ND	ND	ND	110
1,4-Dichlorobenzene	µg/L	1	ND	ND	ND	ND	95
1,2,3-Trichlorobenzene	µg/L	1	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	µg/L	1	ND	ND	ND	ND	2
1,2,3,4-Tetrachlorobenzene	µg/L	1	ND	ND	ND	ND	ND
1,2,4,5-Tetrachlorobenzene	µg/L	1	ND	ND	ND	ND	ND
Hexachlorobenzene	µg/L	1	ND	ND	ND	ND	ND
Trichloroethylene	µg/L	1	28	1100	120	46	34
Tetrachloroethylene	µg/L	1	11	120	21	12	ND
2-Chlorobenzotrifluoride	µg/L	1	ND	ND	ND	ND	ND
4-Chlorobenzotrifluoride	µg/L	1	ND	1	ND	2	10
2,4-Dichlorobenzotrifluoride	µg/L	1	ND	ND	ND	ND	5
3,4-Dichlorobenzotrifluoride	µg/L	1	ND	ND	ND	ND	ND
Hexachlorobutadiene	µg/L	1	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene	µg/L	1	ND	ND	ND	ND	ND
Octachlorocyclopentene	µg/L	1	ND	ND	ND	ND	ND
Perchloropentacyclodecane (Mirex)	µg/L	1	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol	µg/L	10	ND	ND	ND	ND	ND
a-Hexachlorocyclohexane	µg/L	1	ND	ND	ND	ND	ND
b-Hexachlorocyclohexane	µg/L	1	ND	ND	ND	ND	ND
g-Hexachlorocyclohexane	µg/L	1	ND	ND	ND	ND	ND
d-Hexachlorocyclohexane	µg/L	1	ND	ND	ND	ND	ND
Benzoic acid	µg/L	100	ND	ND	ND	ND	ND
2-Chlorobenzoic acid	µg/L	30	ND	ND	ND	ND	ND
3-Chlorobenzoic acid	µg/L	30	ND	ND	ND	ND	ND
4-Chlorobenzoic acid	µg/L	30	ND	ND	ND	ND	ND
Chlorobenzoic acids, total	µg/L	90	ND	ND	ND	ND	ND
Chlorendic acid	µg/L	250	ND	ND	ND	ND	ND
Total Organic Carbon (TOC)	mg/L	1	6	ND2	ND3	7J	ND2
Total Organic Halides (TOX)	µg/L	50	R	R	R	R	R

Notes:

ND - Not detected at or above the detection level shown in the column entitled "Detection Level". Where detection levels vary, the detection level is shown with the respective analyses.

J - Associated result is estimated

R - Result was rejected

TABLE 3
ANALYTICAL DATA SUMMARY
PHASE 2 - ROUND 2 OSI SAMPLING 1993
OCCIDENTAL CHEMICAL CORPORATION
JULY 1993

Sample Description:			*OW658D*	*OW659B*	*OW659C*	*OW659D*	*MW-1*
Sample Date:			*07/12/93*	*07/08/93*	*07/07/93*	*07/13/93*	*07/16/93*
Analytes	*Units*	*Detection Level*					
Phosphorus, Total Soluble	µg P/L	10	ND	ND	ND	ND	17
Arsenic	µg/L	19	ND 23	ND 26	ND 26	ND 33	ND 23
Mercury	µg/L	0.4	ND	ND	ND	ND	ND
Lead	µg/L	18	31	ND 33	ND 33	29	37
Toluene	µg/L	1	3	ND	1	ND	ND
2-Chlorotoluene	µg/L	1	160	190	250	2	ND
4-Chlorotoluene	µg/L	1	11	2	ND	ND	ND
2,4-/2,5-Dichlorotoluene	µg/L	1	22	5	11	ND	ND
2,6-Dichlorotoluene	µg/L	1	3	ND	2	ND	ND
2,3-/3,4-Dichlorotoluene	µg/L	1	2	ND	ND	ND	ND
2,3,6-Trichlorotoluene	µg/L	1	ND	ND	ND	ND	ND
2,4,5-Trichlorotoluene	µg/L	1	ND	ND	ND	ND	ND
Benzene	µg/L	1	1100J	1500	34	3	ND
Chlorobenzene	µg/L	1	540	1200	300	9	ND
1,2-Dichlorobenzene	µg/L	1	100	91	18	ND	ND
1,3-Dichlorobenzene	µg/L	1	330	360	160	ND	ND
1,4-Dichlorobenzene	µg/L	1	200	350	89	ND	ND
1,2,3-Trichlorobenzene	µg/L	1	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	µg/L	1	34	ND	ND	3	ND
1,2,3,4-Tetrachlorobenzene	µg/L	1	ND	ND	ND	14	ND
1,2,4,5-Tetrachlorobenzene	µg/L	1	ND	ND	ND	ND	ND
Hexachlorobenzene	µg/L	1	ND	ND	ND	ND	ND
Trichloroethylene	µg/L	1	23	ND	ND	ND	ND
Tetrachloroethylene	µg/L	1	1	ND	ND	ND	ND
2-Chlorobenzotrifluoride	µg/L	1	ND	ND	ND	ND	ND
4-Chlorobenzotrifluoride	µg/L	1	60	86	190	ND	ND
2,4-Dichlorobenzotrifluoride	µg/L	1	9	7	ND	ND	ND
3,4-Dichlorobenzotrifluoride	µg/L	1	ND	43	ND	ND	ND
Hexachlorobutadiene	µg/L	1	ND	ND	ND	2	ND
Hexachlorocyclopentadiene	µg/L	1	ND	ND	ND	ND	ND
Octachlorocyclopentene	µg/L	1	ND	ND	ND	ND	ND
Perchloropentacyclodecane (Mirex)	µg/L	1	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol	µg/L	10	ND	ND	ND	ND	ND
a-Hexachlorocyclohexane	µg/L	1	5	1	ND	ND	ND
b-Hexachlorocyclohexane	µg/L	1	ND	ND	ND	ND	ND
g-Hexachlorocyclohexane	µg/L	1	ND	ND	ND	ND	ND
d-Hexachlorocyclohexane	µg/L	1	ND	ND	ND	ND	ND
Benzoic acid	µg/L	100	ND	ND	ND	ND	ND
2-Chlorobenzoic acid	µg/L	30	ND	ND	ND	ND	ND
3-Chlorobenzoic acid	µg/L	30	ND	ND	ND	ND	ND
4-Chlorobenzoic acid	µg/L	30	ND	ND	ND	ND	ND
Chlorobenzoic acids, total	µg/L	90	ND	ND	ND	ND	ND
Chlorendic acid	µg/L	250	ND	ND	ND	ND	ND
Total Organic Carbon (TOC)	mg/L	1	ND2	7	12	ND3	ND4
Total Organic Halides (TOX)	µg/L	50	R	R	R	R	R

Notes:

ND - Not detected at or above the detection level shown in the column entitled "Detection Level". Where detection levels vary, the detection level is shown with the respective analyses.

J - Associated result is estimated

R - Result was rejected

TABLE 4

MAXIMUM HOLDING TIMES
PHASE 2 - ROUND 2 OSI SAMPLING
OCCIDENTAL CHEMICAL CORPORATION
JULY 1993

Laboratory Analysis	*Method*	*Maximum Holding Times* (1) *(Contractural)*	*Maximum Holding Times* (2) *(Technical)*
General Organics	OxyChem Microextraction Method	7 days from collection to extraction 40 days from extraction to analysis	NA
Benzene	8020	7 days from collection to analysis	7 days from collection to analysis
HPLC Parameters	Solvent Exchange Method	30 days from collection to analysis	NA
Total Organic Carbon	9060	28 days from collection to analysis	28 days from collection to analysis
Total Organic Halides	450.1	7 days from collection to analysis	7 days from collection to analysis
Total Soluble Phosphorus	365.2	28 days from collection to analysis	28 days from collection to analysis
Arsenic and Lead	200.7	28 days from collection to analysis	6 months from collection to analysis
Mercury	7470	28 days from collection to analysis	28 days from collection to analysis

Notes:
(1) Contractual holding times in accordance with the "QAP".
(2) Technical holding times in accordance with the methods cited.

TABLE 5

SAMPLE HOLDING TIME SUMMARY
PHASE 2 - ROUND 2 OSI SAMPLING
OCCIDENTAL CHEMICAL CORPORATION
JULY 1993

Sample ID	*Analyses*	*Date Sampled*	*Date Extracted*	*Date Analyzed*	*Holding Time (1) (days)*	*Holding Time (2) (days)*
OW652B	General Organics	07/08/93	07/12/93	07/13/93	4	1
	Benzene	07/08/93		07/16/93		8*
	HPLC Parameters	07/08/93	07/14/93	07/15/93	6	1
	TOC	07/08/93		08/05/93		28
	Arsenic and Lead	07/08/93		07/19/93		11
	Mercury	07/08/93		07/16/93		8
	Soluble Phosphorus	07/08/93		07/13/93		5
OW652C	General Organics	07/09/93	07/12/93	07/13/93	3	1
	Benzene	07/09/93		07/16/93		7
	HPLC Parameters	07/09/93	07/22/93	07/23/93	13	1
	TOC	07/09/93		08/05/93		27
	Arsenic and Lead	07/09/93		07/19/93		10
	Mercury	07/09/93		07/16/93		7
	Soluble Phosphorus	07/09/93		07/13/93		4
OW653B	General Organics	07/13/93	07/14/93	07/16/93	1	2
	Benzene	07/13/93		07/20/93		7
	HPLC Parameters	07/13/93	07/22/93	07/23/93	9	1
	TOC	07/13/93		08/05/93		23
	Arsenic and Lead	07/13/93		07/20/93		7
	Mercury	07/13/93		07/16/93		3
	Soluble Phosphorus	07/13/93		07/20/93		7
OW653C	General Organics	07/13/93	07/13/93	07/14/93	0	1
	Benzene	07/13/93		07/20/93		7
	HPLC Parameters	07/13/93	07/22/93	07/23/93	9	1
	TOC	07/13/93		08/05/93		23
	Arsenic and Lead	07/13/93		07/20/93		7
	Mercury	07/13/93		07/16/93		3
	Soluble Phosphorus	07/13/93		07/20/93		7

TABLE 5

SAMPLE HOLDING TIME SUMMARY
PHASE 2 - ROUND 2 OSI SAMPLING
OCCIDENTAL CHEMICAL CORPORATION
JULY 1993

Sample ID	*Analyses*	*Date Sampled*	*Date Extracted*	*Date Analyzed*	*Holding Time (1) (days)*	*Holding Time (2) (days)*
OW657B	General Organics	07/07/93	07/09/93	07/10/93	2	1
	Benzene	07/07/93		07/14/93		7
	HPLC Parameters	07/07/93	07/14/93	07/15/93	7	1
	TOC	07/07/93		07/09/93		2
	Arsenic and Lead	07/07/93		07/19/93		12
	Mercury	07/07/93		07/13/93		6
	Soluble Phosphorus	07/07/93		07/13/93		6
OW657C	General Organics	07/07/93	07/09/93	07/10/93	2	1
	Benzene	07/07/93		07/14/93		7
	HPLC Parameters	07/07/93	07/14/93	07/15/93	7	1
	TOC	07/07/93		07/09/93		2
	Arsenic and Lead	07/07/93		07/19/93		12
	Mercury	07/07/93		07/13/93		6
	Soluble Phosphorus	07/07/93		07/13/93		6
OW657D	General Organics	07/07/93	07/12/93	07/13/93	5	1
	Benzene	07/07/93		07/14/93		7
	HPLC Parameters	07/07/93	07/14/93	07/15/93	7	1
	TOC	07/07/93		07/09/93		2
	Arsenic and Lead	07/07/93		07/19/93		12
	Mercury	07/07/93		07/13/93		6
	Soluble Phosphorus	07/07/93		07/13/93		6
OW658B	General Organics	07/12/93	07/14/93	07/16/93	2	2
	Benzene	07/12/93		07/20/93		8*
	HPLC Parameters	07/12/93	07/22/93	07/23/93	10	1
	TOC	07/12/93		08/05/93		24
	Arsenic and Lead	07/12/93		07/20/93		8
	Mercury	07/12/93		07/16/93		4
	Soluble Phosphorus	07/12/93		07/20/93		8

TABLE 5
SAMPLE HOLDING TIME SUMMARY
PHASE 2 - ROUND 2 OSI SAMPLING
OCCIDENTAL CHEMICAL CORPORATION
JULY 1993

Sample ID	*Analyses*	*Date Sampled*	*Date Extracted*	*Date Analyzed*	*Holding Time (1) (days)*	*Holding Time (2) (days)*
OW658C	General Organics	07/12/93	07/14/93	07/16/93	2	2
	Benzene	07/12/93		07/20/93		8*
	HPLC Parameters	07/12/93	07/22/93	07/23/93	10	1
	TOC	07/12/93		08/05/93		24
	Arsenic and Lead	07/12/93		07/20/93		8
	Mercury	07/12/93		07/16/93		4
	Soluble Phosphorus	07/12/93		07/20/93		8
OW658D	General Organics	07/12/93	07/14/93	07/16/93	2	2
	Benzene	07/12/93		07/20/93		8*
	HPLC Parameters	07/12/93	07/22/93	07/23/93	10	1
	TOC	07/12/93		08/05/93		24
	Arsenic and Lead	07/12/93		07/20/93		8
	Mercury	07/12/93		07/16/93		4
	Soluble Phosphorus	07/12/93		07/20/93		8
OW659B	General Organics	07/08/93	07/12/93	07/13/93	4	1
	Benzene	07/08/93		07/15/93		7
	HPLC Parameters	07/08/93	07/14/93	07/15/93	6	1
	TOC	07/08/93		07/09/93		1
	Arsenic and Lead	07/08/93		07/19/93		11
	Mercury	07/08/93		07/13/93		5
	Soluble Phosphorus	07/08/93		07/13/93		5
OW659C	General Organics	07/08/93	07/09/93	07/10/93	1	1
	Benzene	07/08/93		07/14/93		6
	HPLC Parameters	07/08/93	07/14/93	07/15/93	6	1
	TOC	07/08/93		07/09/93		1
	Arsenic and Lead	07/08/93		07/19/93		11
	Mercury	07/08/93		07/13/93		5
	Soluble Phosphorus	07/08/93		07/13/93		5

TABLE 5

SAMPLE HOLDING TIME SUMMARY
PHASE 2 - ROUND 2 OSI SAMPLING
OCCIDENTAL CHEMICAL CORPORATION
JULY 1993

Sample ID	*Analyses*	*Date Sampled*	*Date Extracted*	*Date Analyzed*	*Holding Time (1) (days)*	*Holding Time (2) (days)*
OW659D	General Organics	07/13/93	07/14/93	07/16/93	1	2
	Benzene	07/13/93		07/20/93		7
	HPLC Parameters	07/13/93	07/22/93	07/23/93	9	1
	TOC	07/13/93		08/05/93		23
	Arsenic and Lead	07/13/93		07/20/93		7
	Mercury	07/13/93		07/16/93		3
	Soluble Phosphorus	07/13/93		07/20/93		7
OW661B	General Organics	07/08/93	07/12/93	07/13/93	4	1
	Benzene	07/08/93		07/16/93		8*
	HPLC Parameters	07/08/93	07/14/93	07/15/93	6	1
	TOC	07/08/93		08/05/93		28
	Arsenic and Lead	07/08/93		07/19/93		11
	Mercury	07/08/93		07/16/93		8
	Soluble Phosphorus	07/08/93		07/13/93		5
MW-1	General Organics	07/16/93	07/19/93	07/19/93	3	3
	Benzene	07/16/93		07/20/93		4
	HPLC Parameters	07/16/93	07/22/93	07/23/93	6	1
	TOC	07/16/93		08/05/93		20
	Arsenic and Lead	07/16/93		07/20/93		4
	Mercury	07/16/93		07/23/93		7
	Soluble Phosphorus	07/16/93		07/30/93		14

Notes:
(1) Sample holding time from collection to extraction
(2) Sample holding time to analysis
* Holding time exceedance

TABLE 6
METHOD BLANK DATA
PHASE 2 - ROUND 2 OSI SAMPLING
OCCIDENTAL CHEMICAL CORPORATION
JULY 1993

Date Analyzed:	*Detection Limit (µg P/L)*	*Blank Conc. (µg P/L) 07/13/93*	*Blank Conc. (µg P/L) 07/13/93*	*Blank Conc. (µg P/L) 07/20/93*	*Blank Conc. (µg P/L) 07/30/93*
Analyte					
Phosphorous, Total Soluble	10	ND	ND	ND	ND

Date Analyzed:	*Detection Limit (µg/L)*	*Blank Conc. (µg/L) 07/13/93*	*Blank Conc. (µg/L) 07/13/93*	*Blank Conc. (µg/L) 07/23/93*
Analyte				
Mercury	0.20	ND	ND	ND

Date Analyzed:	*Detection Limit (µg/L)*	*Blank Conc. (µg/L) 07/19/93*	*Blank Conc. (µg/L) 07/20/93*
Analyte			
Arsenic	26	ND	ND23
Lead	33	ND	ND18

TABLE 6

METHOD BLANK DATA
PHASE 2 - ROUND 2 OSI SAMPLING
OCCIDENTAL CHEMICAL CORPORATION
JULY 1993

Date Analyzed:	*Detection Limit (µg/L)*	*Blank Conc. (µg/L) 07/15/93*	*Blank Conc. (µg/L) 07/16/93*	*Blank Conc. (µg/L) 07/16/93*	*Blank Conc. (µg/L) 07/20/93*
Analyte					
Benzene	1	ND	ND	ND	ND

Date Extracted:	*Detection Limit (µg/L)*	*Blank Conc. (µg/L) 07/09/93*	*Blank Conc. (µg/L) 07/13/93*	*Blank Conc. (µg/L) 07/16/93*	*Blank Conc. (µg/L) 07/19/93*
Compound					
Toluene	ND	ND	ND	ND	ND
2-Chlorotoluene	ND	ND	ND	ND	ND
4-Chlorotoluene	ND	ND	ND	ND	ND
2,4-/2,5-Dichlorotoluene	ND	ND	ND	ND	ND
2,6-Dichlorotoluene	ND	ND	ND	ND	ND
2,3-/3,4-Dichlorotoluene	ND	ND	ND	ND	ND
2,3,6-Trichlorotoluene	ND	ND	ND	ND	ND
2,4,5-Trichlorotoluene	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND
1,2,3,4-Tetrachlorobenzene	ND	ND	ND	ND	ND
1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	ND
Hexachlorobenzene	ND	ND	ND	ND	ND
Trichloroethylene	ND	ND	ND	ND	ND
Tetrachloroethylene	ND	ND	ND	ND	ND
2-Chlorobenzotrifluoride	ND	ND	ND	ND	ND
4-Chlorobenzotrifluoride	ND	ND	ND	ND	ND
2,4-Dichlorobenzotrifluoride	ND	ND	ND	ND	ND
3,4-Dichlorobenzotrifluoride	ND	ND	ND	ND	ND
Hexachlorobutadiene	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND
Octachlorocyclopentene	ND	ND	ND	ND	ND
Perchloropentacyclodecane (Mirex)	ND	ND	ND	*	